

# SUNDRY NEMATODES FROM EASTERN AUSTRALIAN MARSUPIALS

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We published recently some papers dealing with Strongylate nematodes from marsupials in Queensland and New South Wales. The present paper refers mainly to representatives of other nematode groups which are not commonly met with in that mammalian order. For some of the material we are indebted to Mr. L. Gallard, of Narara, near Gosford, N.S.W. (1909-1910), most of the remainder having been collected by the senior author during the same period. The present investigation was carried out in accordance with the terms of a Commonwealth Research grant to the University of Adelaide. Types of the new species have been deposited in the South Australian Museum.

## LIST OF HOSTS AND PARASITES REFERRED TO

- Perameles nasuta* Geoffr.: *Subulura peramelis* Baylis, ***Physaloptera peramelis*** n. sp., *Dipetalonema* sp., *Trichuris peramelis* Baylis.  
*Dasyurus viverrinus* Shaw: *Echinonema cinctum* Linstow.  
*Trichosurus vulpecula* Shaw: *Protospirura marsupialis* Baylis.  
*Petrogale penicillata* Gray: *Dipetalonema* sp.  
*Macropus ruficollis* Desm.: *Dipetalonema* sp.  
*Macropus ualabatus* Less. and Garn.: *Dipetalonema spelaea* Leidy.  
*Macropus agilis* Gould: *Macropostrongylus macropostrongylus* Y. and M., *M. yorkci* Baylis.

Certain other strongyles, described recently by Davey and Wood (1938), are referred to, and a new name is proposed for our *Cloacina minor* (J. and M., 1938).

## SUBULURA PERAMELIS Baylis

(Fig. 1)

From the intestine of a bandicoot, *Perameles nasuta*, Gosford district, N.S.W. (coll. L. Gallard). Only females were collected, 20-21 mm. long. Anterior end with two lateral and four submedian lips, as well as six shorter intermediate processes; lateral lips each with papilla; intermediate process on each side of lateral lip also with papilla; lips much longer than those indicated in Baylis' figure. Mouth small; buccal cavity about 20  $\mu$  diameter anteriorly, widening at base to about 100  $\mu$ , posterior limit difficult to determine, walls thick and chitinated; three large rounded teeth at base of capsule, but accessory teeth not observed. Oesophagus 1.9 mm. long, widening gradually until near base where it becomes deeply constricted and then expanded into a large almost spherical bulb, about 0.2 mm. diameter. Nerve cord not observed. Excretory pore at about mid-length of oesophagus, and 0.65 mm. from anterior end of worm.

Body tapering gradually posteriorly, narrowing suddenly near the tip of the tail; latter conical with tiny papilla at tip; tail 0.5 mm. long; vulva 9 mm. from anterior end, just in front of mid-length of body; uteri divergent; eggs asymmetrical,  $30 \times 40 \mu$ , thick-shelled.

Our specimens show some differences from Baylis' account (1930) of the species, collected from *Perameles obesula*, in North Queensland. They are much longer, and have a larger buccal capsule, longer lips and much smaller eggs.

***Physaloptera peramelis* n. sp.**

(Figs. 2-4)

From stomach of *Perameles nasuta* from Gosford district (L. Gallard), and from three others from Sydney district.

Males 20-30 mm., females 30-40 mm. long. Cuticle very finely striated longitudinally; reflexed around lips but not completely enclosing them. Two lateral lips each with an outer median tooth, internal to latter is a tripartite tooth; each lip bearing a subventral and a subdorsal papilla, and possibly also a larger lateral papilla. Oesophagus 4.3 mm. long in female, anterior muscular portion 0.6 mm. long. Nerve ring at 0.45 mm., and excretory pore at 0.75 mm. from head end. Cervical papillae just in front of level of excretory pore.

*Male*—Posterior end thick; caudal papillae difficult to distinguish; six pedunculate papillae seen on one side, four similar papillae on opposite side; five and three respectively of these were preanal; also three (? two pairs) just in front of anus and four pairs behind anus. Bursa 1 mm. long; our figure is drawn from a dorso-ventrally flattened specimen in which the anterior edge is bent over so that the bursa appears relatively wider than normal. Spicules unequal; one longer, thinner, 0.6 mm. long, 0.04 mm. wide at its base, tapering to a fine point; the other 0.3 mm. (possibly more) long, 0.06 mm. wide at base, tapering towards free end, suddenly constricted near short rounded tip. Surface of bursa with tubercles.

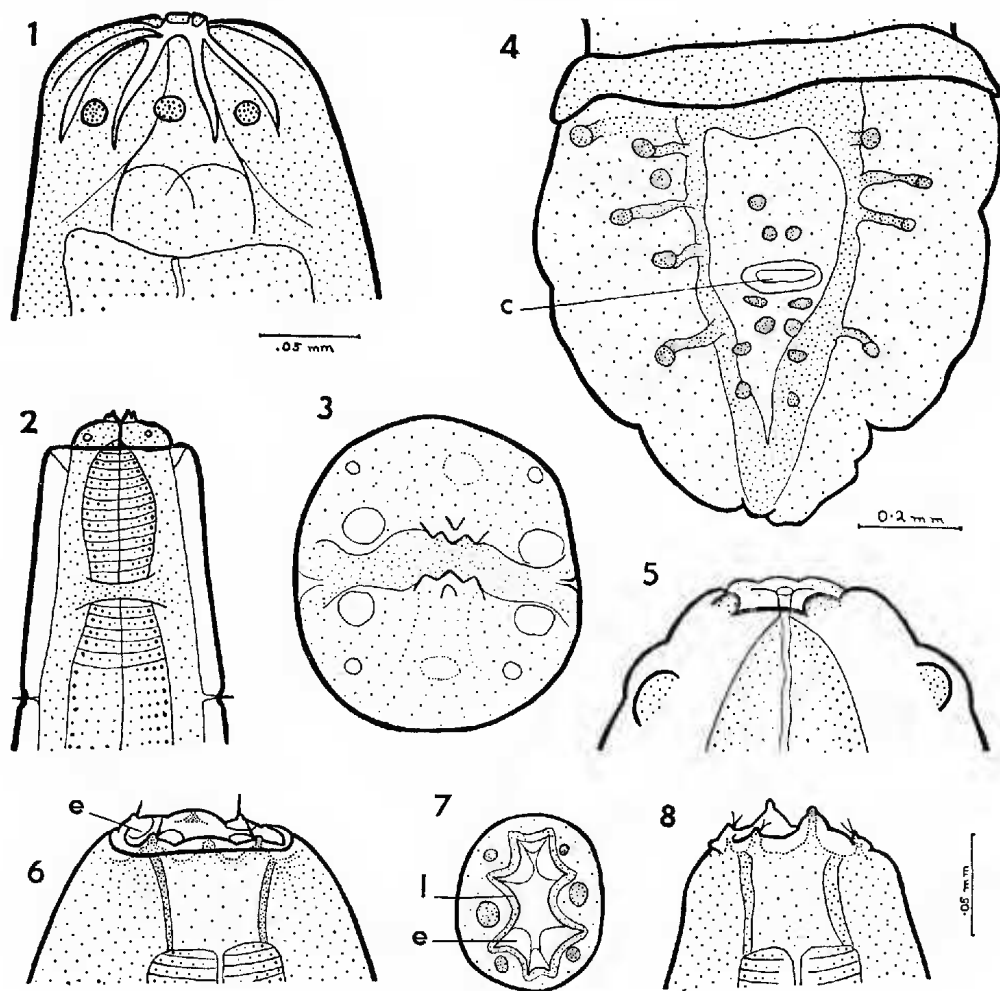
*Female*—Probably only two ovaries. Tail bluntly conical; anus 0.45 mm. from its tip. Vulva at about one-fifth body length from head end; 2.85 mm. behind termination of oesophagus. Eggs 45 by  $34 \mu$ , with larvae and thick shells.

To this species belongs the specimen described (not named) by Ortlepp (1922, 1080-1, fig. 44) from the same host species from London Zoological Gardens, the locality being indicated merely as Australia. Ortlepp found five pairs of postanal papillae in the median series.

***Echinonema cinctum* Linstow, 1898**

A female specimen, 13.1 mm. long, was taken from the intestine of a "native cat," *Dasyurus viverrinus*, in Sydney. The general form of the body agrees with Linstow's account, but the head bears three rows of spines instead of two as stated by him; besides, all spines are shorter than his measurements, the head appears shorter, and the neck is indicated as more markedly constricted. Yorke and Mapleston (1926), in their generic diagnosis for *Echinonema*, stated that

there were three rows of spines on the head, and their figure shows such an arrangement. Since the figure is an original one, we assume that it was based on material collected from a bandicoot in the vicinity of Townsville, North Queensland, Maplestone having been for some time associated with the Institute of Tropical Medicine. Linstow's material came from *Isodon obesulus* from the Upper Burnett River, that species being represented by a very closely related form, *I. macrura*, in northern coastal Queensland.



Figs. 1-8

Fig. 1, *Subulura peramelis*, head. Figs. 2-4, *Physaloptera peramelis*: 2, anterior end; 3, head, anterior view; 4, bursa. Fig. 5, *Dictyalonema* sp. from *Perameles nasuta*, head. Figs. 6-7, *Macropostrongylus yorkei*: 6, head, lateral view; 7, head, anterior view. Fig. 8, *Macropostrongylus macropostrongylus*, head. Figs 1 and 3 are drawn to same scale; 2 and 4; 5 to 8. c, cloaca; e, element of leaf crown; l, lateral lip.

In spite of the discrepancy between Linstow's account and the observations of Yorke and Maplestone and of ourselves, we regard our specimen as belonging to *E. cinctum*. The spines of the third row are much shorter and thinner and

less obvious than those of the first and second rows, and were probably overlooked by Linstow, whose specimens were perhaps also in a different state of contraction, causing the difference in the form of the head and neck and in the disposition of the spines.

There are 14-16 spines in each row in our specimen, their length being 0·13, 0·14 and 0·08 mm., respectively. Then follows an unarmed, slightly narrower, region, measuring 0·06 mm. behind the tip of the spines of the third row; this neck region being succeeded by nineteen rows of shorter spines occupying an area extending back 1·5 mm. from the head end. The spines of the first two and the last three rows are 0·01 mm. long; those of intermediate rows 0·04-0·05 mm. long. Behind this spiny zone, the remainder of the body is covered with minute spinules. Oesophagus 1·1 mm. long, 1:12 of body length; tail 0·5 mm. long.

#### PROTOSPIRURA MARSUPIALIS Baylis

This large nematode is now recorded from *Trichosurus vulpecula* from the vicinity of Sydney. It is already known from Queensland.

#### DIPETALONEMA SPELAEA (Leidy)

A male specimen from the body cavity of *Macropus ualabatus* from the Blue Mountains, New South Wales. In recording the presence of *Filaria* sp. from the host, the senior author (1909) stated that the species appeared to be *F. spelaea*. Our re-examination of the original specimen has shown it to belong to Leidy's species.

#### DIPETALONEMA sp.

An immature female from the vicinity of the liver of *Macropus ruficollis*, from the Gosford district, New South Wales. Length 62 mm.; maximum breadth 0·7 mm.; width across head 0·13 mm.; width at anus 0·13 mm.; tail 0·1 mm. long, conical, with a pair of minute rounded subterminal papillae on ventral side. Cuticle striated transversely.

#### DIPETALONEMA sp.

A female, considerably shrunk and macerated, 95 mm. long, was found in the body cavity of the rock wallaby, *Petrogale penicillata*, from the Gosford district (coll. L. Gallard).

#### DIPETALONEMA sp.

(Fig. 5)

A female from the lung of *Perameles nasuta*, from Sydney. The specimen is a fragment 50 mm. long, with the cuticle striated longitudinally. Head with four, perhaps six, low circum-oral papillae and at least four larger papillae further back. Further details cannot be detected. The head bears a strong resemblance to that figured by Linstow (1898, 470) for an unidentified nematode from *Dasypus* (error for *Dasyurus*) *hallucatus* Gould from the Upper Burnett, Queensland. They probably belong to the same species. Two rows of papillae occur also in

*D. robertsi* Johnston and Mawson, 1938, but the head is larger and the circumoral papillae closer to the mouth than in the latter species.

#### TRICHIURIS PERAMELIS Baylis

A number of females, some of them fragmentary, were found in the intestine of *Perameles nasuta*, from the vicinity of Sydney. Length 6.5-10.1 mm. In the largest specimen the oesophageal region was 5.7 and the rest of the body 5.4 mm. Maximum breadth of anterior region 0.05 mm.; of posterior region 0.08 mm.; width at junction of the two parts 0.06 mm. Cuticular striations not recognised. Eggs 44-46  $\mu$  long (including polar plugs); 20-23  $\mu$  wide.

Our specimens show considerable differences from the females of Baylis' species which was obtained from *Isodon obesulus* from North Queensland. These may be tabulated:

	<i>T. peramelis</i> Baylis	N.S.W. Specimens
Length of female - - -	11 to 19.5 mm.	6.5—10.1 mm.
Oesophagus: body length -	2:3; 3:4	1:2
Length of oesophageal region	8.3—15.4 mm.	5.7
Length of posterior region -	2.7—5.5 mm.	5.4
Maximum breadth - - -	0.19—0.33 mm.	0.08
Breadth at junction of the two regions - - - -	0.1—0.17 mm.	0.06
Eggs - - - - -	0.053 by 0.028—0.03 mm.	0.02—0.023 mm.

It is with considerable doubt that we place our specimens under *T. peramelis*, but in view of the few females examined, and the absence of males, we deem it unwise to erect a new species.

#### CLOACINA CORNUTA (Davey and Wood, 1938) J. and M.

This species was described from *Macropus agilis*, North Queensland, as *Macropostrongylus cornutus*, but its characters appear to us to agree with those of *Cloacina*, a revised diagnosis of which was published recently by us (1938) and a comparison with *Macropostrongylus* was made. *C. cornuta* resembles *C. robertsi* J. and M. (1939) in many features, but possesses longer submedian papillae; a relatively deeper, thinner and more anteriorly placed buccal ring; shorter spicules; and a differently shaped dorsal ray. It also resembles *C. similis* J. and M. (1939) in regard to the head papillae and most measurements, but the former has a shallower buccal ring, slightly shorter spicules, and a narrower female tail.

#### CLOACINA MINOR (Davey and Wood, 1938) J. and M.

This species from *Macropus robustus*, North Queensland, was placed under *Macropostrongylus*, but we refer it to *Cloacina*. The head is rather like that of *C. macropodis* J. and M. (1938), but the papillae are larger and the buccal ring thinner, while the dorsal ray has shorter terminal branches, and the length of the spicules and relative positions of the anus and vulva are different.

***Cloacina longelabiata* nom. nov.**

Our assignment of *Macropostrongylus minor* Davey and Wood (1938) to *Cloacina* necessitates the renaming of our *C. minor*, the accounts of both species having appeared in 1938, but the former has priority. We suggest *C. longelabiata* for our form on account of its long wide lips.

**PHARYNGOSTRONGYLUS ORNATUS Davey and Wood, 1938**

This worm from *Macropus robustus*, North Queensland, resembles closely *P. gamma* J. and M. (1939) but differs in the length of the dorsal ray, ratio of spicule to body length, position of cervical papillae and excretory pore, form of the oral papillae, and the absence of bifid bristles on the papillae.

**REMARKS ON MACROPOSTRONGYLUS**

(Figs. 6-8)

Specimens of *M. macropostrongylus* Yorke and Maplestone and *M. yorkei* Baylis, recorded recently by us (1939) from *Macropus agilis* from North Queensland, were examined. In both species there are setae on the submedian papillae—a single long bristle on each in *M. yorkei*, and a pair on each in *M. macropostrongylus*.

Baylis in his account of *M. yorkei* was doubtful regarding the presence of a leaf-crown, but the structure occurs in our specimens where it consists of six elements in submedian, dorsal and ventral positions, the dorsal and ventral elements being much smaller than the others. The wide lateral lips appear to be without elements. The head of *M. yorkei* is indicated in figs. 6-7, and that of *M. macropostrongylus* in fig. 8.

**LITERATURE**

- BAYLIS, H. A. 1930 Some Heterakidae and Oxyuridae (Nematoda) from Queensland. A.M.N.H. (10), **5**, 354-366
- BAYLIS, H. A. 1932 A new species of the Nematode genus *Trichuris*, from Queensland. A.M.N.H. (10), **9**, 31-32
- DAVEY, D. G. and WOOD, W. A. 1938 New species of Trichoneminae (Nematoda) from Australian kangaroos. Parasitol., **30**, 258-266
- JOHNSTON, T. H., and MAWSON, P. M. 1938 An account of some Filarial Parasites of Australian Marsupials. Trans. Roy. Soc. S. Aust., **62** (1), 107-121
- JOHNSTON, T. H., and MAWSON, P. M. 1938 Some Nematodes from Australian Marsupials. Rec. S. Aust. Mus., **6** (2), 187-198
- JOHNSTON, T. H., and MAWSON, P. M. 1939 Strongylate Nematodes from Queensland Marsupials. Trans. Roy. Soc. S. Aust., **63** (1), 121-149
- LINSTOW, O. v. 1898 Nematoda. In Semon's Forschungsreisen in Australien, **5**, 469-471
- ORTLEPP, R. J. 1922 The Nematode genus *Physaloptera*. Proc. Zool. Soc., Lond. (4), 999-1,107.
- YORKE, W., and MAPLESTONE, P. A. 1926 The Nematode Parasites of Vertebrates. Lond.